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**REMARKS**

The specification has been amended. Support for the amendment may be found on Table 4 in the specification and on page 34, lines 5 through 14 of the specification, which incorporates U.S. Patent No. 5,756,684 (the "'684" patent) by reference. The '684 patent was incorporated for the molecular biology techniques and assays contained within. Specifically, the hybridization and wash times are brought from column 35, lines 29-37 of the '684 patent.

In addition, claims 1, 18, and 53 have been amended to include amino acids that encode proteins with 95% identity to SEQ ID NO:2. Support for this amendment may be found on page 26, lines 10-12 of the specification.

**Telephonic Interview**

Applicants thank the Examiner the telephone interview wherein the current office action was discussed. The discussion was very helpful in reviewing proposed amendments to the specification and the claims. The present amendment and remarks are submitted pursuant to those discussions.

**Claim Rejections – 35 U.S.C. § 112, first paragraph, enablement**

The Examiner has rejected claims 1, 5, 7-8, 10-12, 14, 18-19, 21-32 and 53-54 under 35 U.S.C. § 112, first paragraph, as allegedly failing to enable one of ordinary skill in the art to make and use Na<sup>+</sup>/H<sup>+</sup> transporter-encoding nucleic acids that hybridize to SEQ ID NO:1 under "moderately stringent" or "highly stringent" conditions. The Examiner has asserted that the specification lacks sufficient guidance as to what "moderately stringent" and "highly stringent" conditions are.

Applicants respectfully disagree with the Examiner's grounds for rejection and the above statements. However, in order to facilitate prosecution in this case applicants have amended the pending claims and the specification, without prejudice or disclaimer, to specify conditions of the wash. One of ordinary skill in the art is now clearly enabled for both making and using the claimed

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invention. With respect to making, with the clear definitions, one of skill in the art is fully enabled to make the claimed invention commensurate in scope with the claims. Making the claimed invention merely requires screening plant gene libraries with the SEQ ID NO:1 nucleic acid as a probe under the detailed hybridization conditions. Generating such libraries and screening them is routine in the art. Once clones have been identified, one of skill in the art would then apply routine molecular biology to generate the claimed constructs and transform a selected plant with such construct. Screening for plants with the claimed function is routine to account for position affects, rearrangement of genes, etc. Thus one of skill in the art will have no difficulty in making and using the claimed invention.

Therefore, one of skill in the art is enabled to make and use the claimed invention. Applicants respectfully request that the Examiner withdraw the enablement rejection.

Claim Rejections - 35 U.S.C. § 112, first paragraph, written description

The Examiner has rejected claims 1, 5, 7-8, 10-12, 14, 18-19, 21-32 and 53-54 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement because "highly stringent" and "moderately stringent" conditions are not defined.

Applicants respectfully disagree with the Examiner's grounds for rejection and the above statements. However, as discussed above, in order to facilitate prosecution in this case applicants have amended the pending claims and the specification, without prejudice or disclaimer, to specify exact conditions. The claims now clearly specify the wash condition used in hybridization. Thus, one of skill in the art will understand that the inventor was in possession of the claimed invention.

The Examiner has rejected claims 18 and 53 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. The Examiner has asserted that the written description is lacking because the claims do not recite a function for the protein encoded by the nucleic acid, nor do they require that it does encode a protein.

Claims 18 and 53 have been amended to include the recitation "a recombinant nucleic

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acid molecule encoding a polypeptide having Na<sup>+</sup>/H<sup>+</sup> transporter activity..."

Thus, the written description requirements have been met because one of skill in the art would recognize that the inventors were in possession of the claimed invention as of the filing of this application. Applicants respectfully request that the Examiner withdraw the written description rejection.

Claim Rejections – 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 1, 5, 7-8, 10-12, 14, 18-19, 21-32 and 53-54 under 35 U.S.C. § 112, second paragraph, as allegedly failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention because "highly stringent" and "moderately stringent" conditions are not defined.

Applicants respectfully disagree with the Examiner's grounds for rejection and the above statements. However, as discussed above, in order to facilitate prosecution in this case applicants have amended the pending claims and the specification, without prejudice or disclaimer, to specify exact conditions. The claims have been amended to include the specific wash conditions used.

The Examiner has rejected claims 31-32 under 35 U.S.C. § 112, second paragraph, as allegedly failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention because the preamble does not match the result of the claim.

Applicants respectfully disagree with the Examiner's grounds for rejection and the above statement. However, in order to facilitate prosecution in this case applicants have amended the pending claims, without prejudice or disclaimer, to include the preamble language in the claim.

The Examiner has rejected claims 1 and 18, part (b) and claim 53, part (a) under 35 U.S.C. § 112, second paragraph, as allegedly failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention because "the same amino acid sequence as encoded by the nucleic acid sequence of (a)" is unclear.

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Applicants respectfully disagree with the Examiner's grounds for rejection and the above statement. However, in order to facilitate prosecution in this case applicants have amended the pending claims and the specification, without prejudice or disclaimer, to recite "the amino acid sequence shown in SEQ ID NO:2", which has the same meaning.

The Examiner has rejected claim 1, parts (c) and (d), claim 18, part (c) and (d), and claim 53, part (a) under 35 U.S.C. § 112, second paragraph, as allegedly failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention because "specifically hybridizes" is unclear.

Applicants respectfully disagree with the Examiner's grounds for rejection and the above statement. With the addition of the wash condition in part (c) and (iii), one of skill in the art will understand that specific hybridization is provided by the wash condition and therefore clear.

The Examiner has rejected claims 5 and 12 under 35 U.S.C. § 112, second paragraph, as allegedly failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention because "the PNHX transporter polypeptide" only occurs in part d.

Applicants respectfully disagree with the Examiner's grounds for rejection and the above statement. However, in order to facilitate prosecution in this case applicants have amended the pending claims and the specification, without prejudice or disclaimer, to replace the recitation "the PNHX transporter polypeptide" with "the polypeptide having Na<sup>+</sup>/H<sup>+</sup> transporter activity", which has antecedent support in claim 1 for parts (a)-(d).

Claim Rejections – 35 U.S.C. § 102

Claims 1, 5, 8, 10, 12, 14, 18-19, 21-24, 26-28, 30-32 and 53-54 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Young et al (WO 91/06651). The Examiner has asserted that the sod2 gene from yeast would hybridize to SEQ ID NO:1 at both high and moderate stringency. The Examiner has further stated that under some definitions, yeast are plants.

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Applicants respectfully disagree with the Examiner's grounds for rejection and the above statement. However, in order to facilitate prosecution in this case applicants have amended the pending claims and the specification, without prejudice or disclaimer, so that the wash condition or percent identity is explicitly recited. With such amendment, the claims are clearly not anticipated by Young et al. One of skill in the art would not expect the sod2 gene from yeast to hybridize to SEQ ID NO:1 under conditions that include at least one wash in 0.1xSSC, 0.1% SDS, at 65° C for thirty minutes, and the sod2 protein is less than 95% identical to SEQ ID NO:2.

Thus, applicants respectfully request that the Examiner withdraw the § 102 rejection.

Claim Rejections – 35 U.S.C. § 103

Claims 1, 5, 8, 10, 12, 14, 18-19, 21-28, 30-32 and 53-54 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Young et al (WO 91/06651) in view of Gordon-Kamm et al (1990, Plant Cell 2:603-618).

As discussed above, the claims have been amended so that the nucleic acid molecule in the claims is clearly distinguishable from the sod2 gene disclosed in Young et al. One of skill in the art would not expect the sod2 gene from yeast to hybridize to SEQ ID NO:1 under conditions that include at least one wash in 0.1xSSC, 0.1% SDS, at 65° C for thirty minutes, and the sod2 protein is less than 95% identical to SEQ ID NO:2. Thus, Young et al in view of Gordon-Kamm et al. lack an element of the claims. *A prima facie* case of obviousness must include all elements of the claims.

Thus, applicants respectfully request that the Examiner withdraw the § 103 rejection.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 529642000200.

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Respectfully submitted,

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